

THE LAKE ARTHUR COMPLEX JEFFERSON DAVIS AND VERMILION PARISHES, LOUISIANA: HOW IT FITS INTO THE REGIONAL DEPOSITIONAL FRAMEWORK OF THE CAMERINA "A"—MIOGYPSINOIDES "A" INTERVAL.

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ABSTRACT

The Lake Arthur Complex is one of the many normal mega-sized structural features which fits into the normal South Louisiana regional framework when completely studied and understood. This Complex covers in excess of one hundred square miles being approximately two townships North-South and one and one-half townships East-West located in Jefferson Davis and Vermilion Parishes, Louisiana. To explain this mega-feature requires an understanding of the regional structure and stratigraphic depositional patterns of each of the major paleontological sequences from the older *Bolivina mexicana* through the younger *Discorbis* restricted intervals, covering sediments of middle Oligocene age into the younger lower Miocene age.

The Lake Arthur Complex encompasses six producing field areas as recognized by the Louisiana Department of Conservation. These fields produce from multiple sands ranging in age from middle Oligocene through lower Miocene. The productive areas are related to a combination of their structural relationship to the overall complex, the stratigraphic depositional patterns of the producing sands as related to regional depositional faulting, and the stratigraphic depositional patterns of the producing sands related to the growth history of this Complex. Each of these variables, or a combination of these variables, have a significant controlling effect on the individual producing areas within the Complex.

One of the more significant producing intervals of the Lake Arthur Complex is the sand packages in the *Camerina* "A"—*Miogypsinoides* "A" middle Oligocene sediments. This interval produces on the North flank of the Complex in T-10-S, R-4-W; on the South flank in T-11-S, R-3-W; on the structural crest and in associated crestal fault block traps. Ultimately the Lake Arthur Complex may produce in excess of 5 trillion cubic feet of gas with the *Camerina* "A"—*Miogypsinoides* "A" responsible for approximately 75% of the estimated production.

Each of the significant *Camerina* "A"—*Miogypsinoides* "A" producing areas on the overall complex is discussed structurally and stratigraphically including their relationship to the overall regional depositional framework and history of the *Camerina* "A"—*Miogypsinoides* "A" stratigraphic interval.

The conclusions which have resulted from this study and analysis of the Lake Arthur Complex are that it does fit into a normal structural and depositional framework for South Louisiana and does not require a localized special case explanation for any portion of the Complex.

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